

## Growth Effectiveness of Aid, FDI and Remittances: An Empirical Study of Fiji

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### Abstract

*Pacific island countries (PICs) are well known for their dependency on aid inflows to supplement their savings and growth. As domestic markets are small, foreign direct investment (FDI) for local consumption is least attractive. Most of FDI inflows are in the tourism sector. In recent years, PICs are emerging as leading recipients of remittances from migrant islanders working overseas. This paper seeks to assess the relative effectiveness of aid, remittances and FDI inflows on growth by taking up Fiji as a case study. The findings reveal remittances have proved to be the most effective of the three for promoting economic growth.*

### Introduction

Pacific island countries<sup>1</sup> (PICs), since their political independence in the 1970s, have been among the world's largest recipient countries of official development assistance (ODA), popularly known as aid. In the late 1990s, the focus of aid by donor countries, although dictated by geopolitical interests and secondarily influenced by humanitarian considerations, underwent changes. The donors began to cut down aid for budgetary support but directed it more towards growth enhancing physical infrastructure, such as ports, jetties and rural roads.

<sup>1</sup> The 14 Pacific island countries (PICs) are: Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

In recent years, notably from the early 2000s, steadily rising inward remittances<sup>2</sup> sent by migrant islanders residing and working in Australia, New Zealand, United States and Europe, have exceeded aid inflows to PICs, both expressed as percentages of GDP. On the other hand, annual foreign direct investment (FDI) inflows have been less and fluctuating. The FDI inflows to PICs were confined to tourism sector, in particular with reference to hotel and resort facilities, as production related investments were not attractive because of smallness of domestic markets.

There is a growing body of empirical literature on the roles of various private capital inflows covering aid, remittances and FDI in promoting growth as well their relative effectiveness. Notable, recent studies include Benmamoun and Lehner (2013), Driffield and Jones (2013), and Shazad *et al.* (2014). Studies specifically dealing with PICs relating to aid are World Bank (1993), Gounder (2001), Jayaraman and Choong (2006a), Jayaraman and Ward (2006), Chen and Singh (2014), whereas studies on remittances include Prakash and Gounder (2009), Jayaraman *et al.* (2009, 2010, 2011). The studies on FDI in PICs are Gani (1999), Jayaraman and Choong (2006b), Jayaraman and Singh (2007) and Feeny *et al.* (2014).

However, there has been no single study on PICs in regard to the relative effectiveness of aid, remittances and FDI, all taken together. The objective of this paper is to fill the gap with a view to investigating: (i) existence of any long-run relationship between all the three and economic growth; (ii) direction of causality in the event of cointegration; and (iii) relative effectiveness of aid, remittances and FDI in promoting growth. Ideally speaking, a panel study dealing with all PICs would have been appropriate, since they all share many commonalities such as poor human and natural resources; high dependency on imports of food and fuel and transport equipment; narrow range of exports of similar nature such as tropical fruits like bananas, copra and fish; and low level of savings and the resultant shortage of capital for growth enhancing investment. However, inadequate database for a large number of PICs as well as inconsistent time series have been a major handicap for a panel study. Since amongst all PICs, Fiji, which is better endowed with skilled human resources working in the area of data collection and processing in its Bureau of Statistics, has consistent time series of data over a period of three decades. As a result, this study focuses on Fiji as a case study.

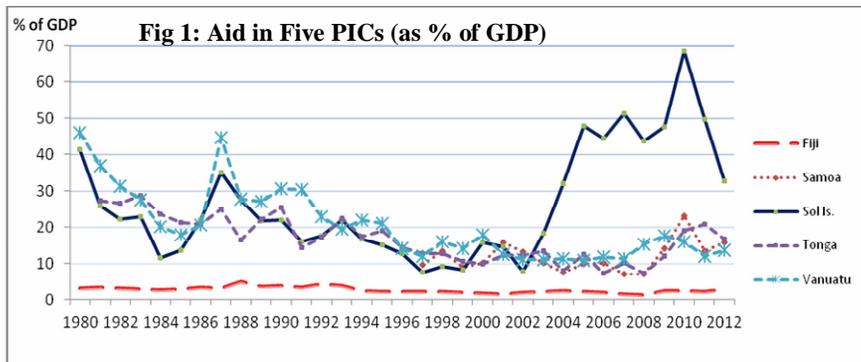
<sup>2</sup> The term since the revision of the Balance of Payments Manual (6<sup>th</sup> edition) by World Bank represents a broader definition of the original term 'worker remittances'.

## Aid, Remittances and FDI Inflows in the Pacific

### Aid in the Pacific

Aid to PICs, which was purely in terms of bilateral grants from donor countries, especially from their past colonial rulers, assisted the recipient countries in financing recurrent expenditures such as wages and salaries and other housekeeping expenditures. With the end of the Cold War in the late 1980s, the priorities of advanced countries changed as they aimed at rehabilitation of the East European states. The downward trend in ODA to PICs began in the 1990s. With that, aid focus too changed as emphasis was laid on growth enhancing investments in physical infrastructure. Consequently, aid for budgetary support declined substantially, with some donor countries especially the United Kingdom discontinuing aid for recurring expenditures.

Fiji, being more developed with skilled human resources and some manufacturing base, has been traditionally receiving least aid in terms of percentages of GDP. Among the PICs excluding PNG<sup>3</sup>, Solomon Islands has been the highest recipient of aid, most of which has been from Australia under Regional Assistance Mission to Solomon Islands (RAMSI) as part of rehabilitation relief following the ethnic riots of the early 2000s. Figure 1 shows this pattern.



Note: Data series for Samoa starts from 1997; for Tonga from 1981; and others from 1980. (Source: World Development Indicators (WDI) Online.)

<sup>3</sup> Among the 14 PICs, PNG is an outlier as its land, population, natural resources with oil and natural gas and other minerals place the country far ahead of the other 13 countries in terms of growth potential. Hence our study leaves out PNG from the study focus.

There has been a prolonged and still continuing debate about the role of external aid in promoting economic growth and development in PICs. The debate on aid effectiveness began in full earnest with World Bank's study (1993) in six volumes on PICs. The study described the performance of PICs poor, calling it as a *Pacific Paradox*: poor growth in the midst of plentiful aid, since PICs fared badly when compared to similarly placed island countries in the Caribbean and Indian Ocean regions. Critics from leading donor countries followed the World Bank study with severe indictment of aid wastage. Hughes (2003) led the critics by observing aid had failed PICs since aid moneys were spent on government consumption; and further bilateral agencies did not have any conditionalities attached to their aid programs and proper monitoring of use of aid for the purposes it was intended, unlike in the case of loans and other modes of assistance from international funding agencies such as the World Bank and Asian Development Bank.

Following these criticisms, donor countries, led by the largest aid giver to PICs, Australia, introduced changes in the modalities of aid delivery and monitoring of aid utilization as well as coordination with a view to reduce aid duplication. With periodical changes in governments in donor countries, policies have also undergone major transformation adjusting to emerging security concerns in the South Pacific with new players led by Asia/Pacific's major power, China (Claxton, 2015). In 2014, Australia abolished the nearly forty year old Australian International Aid Agency (AusAID), merging its functions with the Department of Foreign Affairs and Trade. The avowed purpose was to support Australian foreign trade policy in pursuit of its national interests. Although, the policy statement announced that the geographic priority would continue to be the Indo-Pacific region, especially South Pacific and South East Asia, the indications were clear that aid would be scaled down (Doolan, 2013).

The cuts in the Australian aid programme came into effect in December 2014. It is anticipated this would continue to 2016-17. Howes and Pryke (2014) estimated aid would be 33 percent less than it was relative to the previous government's final year of aid spending in 2012-13.

Australia has been the largest aid giver for many PICs. Its aid in terms of the GDPs of respective PICs ranges from Nauru: 65 percent; Papua New Guinea: 60 percent; Vanuatu: 40 percent; Fiji: 30 percent; Solomon Islands: 27 percent; Samoa: 20 percent; and Tonga: 18 percent. The cuts in Australian aid are feared to have serious implications for all the aid recipient countries in the Pacific (Wood, 2015), as most of the aid has been in recent years in growth enhancing areas, such as health and education projects, which have long gestation periods.

### Remittances in the Pacific

While aid inflows have been declining for one reason or another, the other form of unrequited transfer of resources is remittances. These transfers have become steady and growing during the last two decades. As noted earlier, the term used in the Balance of Payments Manual (6<sup>th</sup> edition) is no longer 'worker remittances', which in the past referred to steady and regular payments sent by workers, skilled and unskilled, working overseas on temporary permits or on permanent residency status. The revised term, 'personal remittances' includes all current transfers in cash or kind, independent of the source of incomes of the sender, regardless of source, whether labour, or property income or disposal of assets by residents overseas who want to return eventually to their countries of origin for settling down by building new houses or renovating their dwelling places. Thus, the term remittances as re-defined would indicate that they might be financing current consumption as well as investment. The reporting system has found it difficult to distinguish the original purposes behind remittances, whether they are for immediate consumption by families left behind or for their own long term investment purposes, including housing or real estate including farming or for both. Hence, remittances are reported as such without any distinction. It is only longitudinal surveys, over a period of thirty years or more, of consumption patterns or setting remittances received in whole or in parts as savings for future use in house construction or purchase of any built up property or real estate, which can inform the researchers of the use of funds. To the best of knowledge of the authors of this study, no such longitudinal surveys of the remittance recipient families in the country are underway or being contemplated by government or international agencies in Fiji or any PIC.

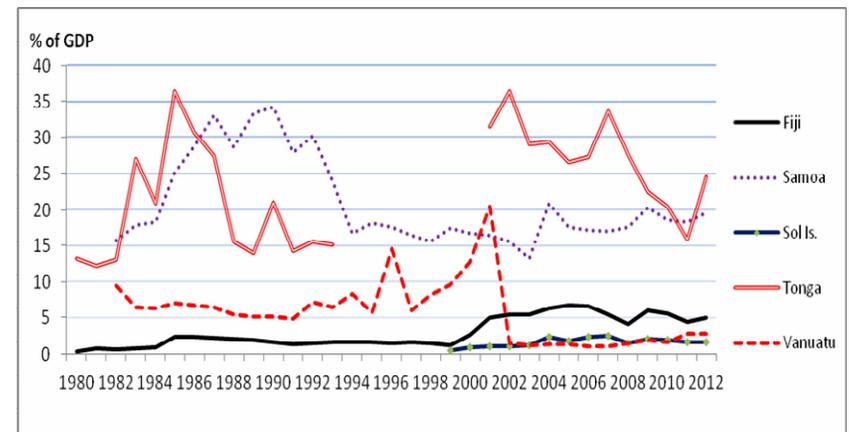
Studies including those by World Bank (2006) and Browne and Mikeshima (2007) have highlighted the growing potential of temporary migration schemes for unskilled citizens of small remote islands, which were introduced in late 2000s, as an experimental measure in respect of a few PICs. These schemes now cover major PICs, including Fiji, which are expected to be mutually beneficial as there was a serious shortage of supply of labour to work on orchards in Australia and New Zealand.

Remittances have been found to be a boon for households in PICs, as elsewhere, since they have been supplementing disposable incomes of the recipient families (Chami and Fullenkamp, 2013). They are spent on consumption of clothing, food, medicine and shelter. They have also enabled them to invest in education and health care, besides investments in semi durable goods. They were also a support to some families to under-

take simple food processing microenterprises such as pickles, chutney and condiments for local markets, since they found out remittances are a source of funding new production opportunities for commercial purposes.

As remittances relaxed credit constraints imposed by the undeveloped financial sector, governments realized the immense potential of remittances in triggering entrepreneurial efforts and are now encouraging financial institutions to help in channelling remittance inflows through formal banking channels. Banks have responded in turn by opening more branches in urban as well as new branches in rural areas and introducing mobile banking in inaccessible areas. These efforts are expected to facilitate enhanced financial development by realizing greater economies of scale in financial intermediation. Figure 2 shows that Samoa and Tonga are the largest recipients of remittances as percent of GDP.

**Figure 2: Remittances in Five Pacific Island Countries (as % of GDP)**



Note: For Samoa, data series start from 1982; Solomon Islands from 1999; Tonga from 1994 to 2000, Vanuatu from 1982; and Fiji from 1980.

(Source: World Development Indicators (WDI) Online)

### Foreign direct investment

Since PICs' financial and capital markets are undeveloped and domestic investment activities are small, capital inflows have not been remarkable. Further, there are considerable institutional and structural rigidities in factor markets as well, which have been attributed to custom-

ary land tenure restricting the availability of land. These rigidities have been deterrents to land based investment projects.

Further, we find interest rate differentials have not played any role. There are no financial assets which have emerged to be substitutable and attractive enough from overseas investors' point of view. Furthermore, interest rates in PICs are found to be non-responsive in the short run to shifts in supply and demand. Prices do not adjust to equilibrate the demand for and supply of the limited financial assets, and most of the adjustment falls on quantities rather than on prices. In these circumstances, interest rate settings do not play any role in either attracting or deterring short term flows and hence monetary policy has limited scope for influencing short term capital inflows (Morling and Singh, 2006).

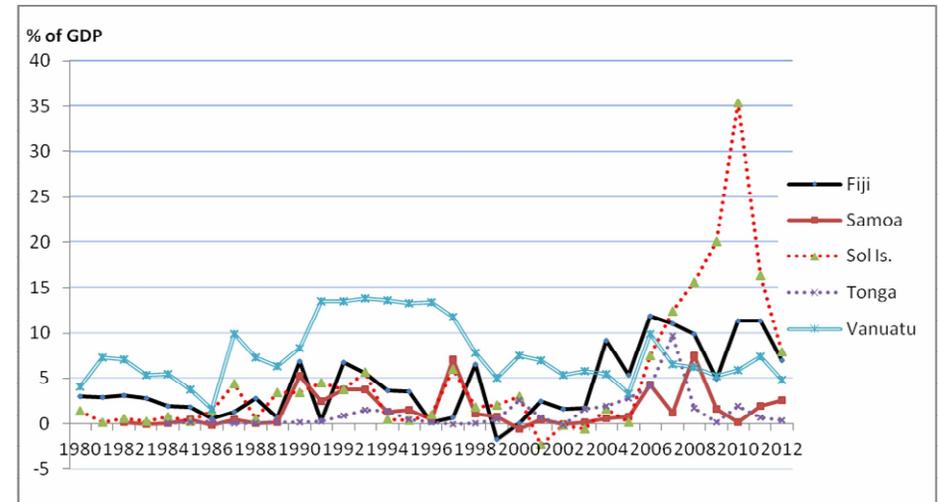
The PICs have been increasingly appreciative of the fact that in light of declining aid inflows, it would be more prudent to place emphasis on FDI inflows, which have been acknowledged as the most constructive of all flows for emerging markets. Above all, FDI inflows are less volatile and less prone to sudden withdrawal due to shifts in sentiment unlike hot moneys. FDI inflows promote economic development through transfer of new technology and spillover efficiency only when supported by a high degree of absorptive capacity in terms of human capital and supportive trade regime in the recipient country (see Balasubramanyam *et al.*, 1996; Borensztein *et al.*, 1998; Xu, 2000; Kohpaiboon, 2003).

The term FDI would normally refer to substantial equity stake and effective control of enterprises. However, in the context of growing services sector in developing countries, a broader definition seems to have been emerging. This now refers to non-equity participation by foreigners by way of licensing, franchising, joint ventures with limited equity participation and R&D cooperation (de Mello, 1997). Historical ties with the United Kingdom, Australia and New Zealand have largely influenced FDI flows to PICs in some specific areas. Most of the FDI inflows to PICs in the past were primarily of the natural resource exploiting type: the former Australian-owned Colonial Sugar Refinery (CSR) in Fiji, a plantation venture in the 19<sup>th</sup> century which was once Fiji's successful export oriented investment and now on a decline; and presently thriving resort hotels; successful palm oil and cocoa plantations in the Solomon islands in the 1960s owned by British interests, and tuna fisheries and canning by Japanese investors in the 1980s; and cattle ranches on Santo island of Vanuatu, supplying beef exports to Japan and Europe.

These natural resource based FDI inflows were later on followed in the 1980s by FDI in export-oriented, labour intensive garments and other industries due to deliberate policies of Fiji's interim governments follow-

ing the military coups in 1987 (Jayaraman and Choong, 2005; Gani, 1999). Aside from agriculture-based industries, the sun-sea-surf linked tourism activities have been on the rise, which are attributed to substantial FDI inflows in the 1990s from well-known international resort-hotel chains. The third type of investment, known as market seeking, was mainly limited to retail trade, as the populations of PICs were small. These included retailers including Burns Philp and Carpenters of Australia, which set up supermarket chains and the Cost U Less of Hawaii. In the early 1990s, Japanese investors showed interest in setting up export-oriented type of investments in light industries. The Yazaki automobile wiring harness plant in Samoa, which exported its products to car assembling plants in Japan and Australia, is a leading example of this. Newly industrialized countries such as Korea, Malaysia and Singapore also entered the scene. Their interests are confined to the services sector.

**Figure 3: FDI in Five Pacific Island Countries (as % of GDP)\***



\* Data for Samoa data starts from 1982; for Tonga from 1984 and others from 1980.

(Source: World Development Indicators (WDI) Online).

Figure 3 presents net FDI inflows to five PICs. In the earlier years, flows of FDI to Vanuatu remained steady, unlike the case of Fiji, where they were negative during some years. The apparent reason behind Vanuatu being the leading recipient of FDI flows has been the very high degree of openness of its economy, associated with its pure tax haven status

(there is no direct taxation of any kind on local residents, citizens or expatriates). Fiji, with its relatively larger endowment of skilled human resources and its investor friendly tax policies and incentives introduced since 2011, has been attracting large FDI inflows. In more recent years, regional integration efforts by PICs have offered opportunities to manufacturing industries in Australia and New Zealand for locating their units in Fiji for producing consumer goods for the South Pacific region as a whole, as eventual elimination of trade tariffs and quantitative restrictions first by Melanesian Spearhead Group of PNG, Fiji, Solomon Islands and Vanuatu is likely to generate freer trade than otherwise possible.

### Fiji's Economy

Amongst the 14 PICs, Fiji is the only country which is classified as an upper middle income country. Its per capita is USD4,375, while the other PICs are classified as low income countries, with per capita incomes below the threshold level at USD1,025. Selected key indicators are presented in Table 1.

**Table 1: Selected Key Indicators, Fiji**

Land Area (Sq.km.'000)	18,270
Population in '000 (2013)	881
Per Capita GDP (US\$) Current prices (2013)	4,375
Aid Per Capita in US\$ (2012)	81.2
Aid as percentage of GDP (2012)	2.7
Human Development Ranking (2013)	88/187
Annual Average Growth Rate (%) (2009-13)	1.9
Annual Average Inflation (%) (2009-13)	4.8
Overall Budget Balance (% of GDP) (2009-13)	-7.4
Current Account Balance (% of GDP) (2009-13)	-6.0

Source: World Bank (2014).

Fiji has traditionally been the least recipient of aid amongst PICs. Its relatively broad based tax system as well a relatively large manufacturing sector has enabled Fiji to depend much less on aid than other countries. In more recent times aid has decreased, as metropolitan countries had imposed sanction and reduced aid flows following the military coups of 2000 and 2006. The continued isolation of the country by donors since 2006 has contributed to decreasing annual aid flows to Fiji.

On the other hand, increased migration over the last two decades of skilled people, initially instigated by the two military coups of 1987, and by continued uncertainties in the political environment after the 2006

coup, increased in remittances down the line. In regard to FDI, despite initial reactions to the 2006 military coup, reforms introduced by the military regime, including tax reforms and adoption of more investor friendly policies with a low corporate income tax rate, and pronouncements of bringing back democratic framework and restoration of stability culminating in a new constitution and fresh elections, encouraged flows of FDI in mineral and tourism sectors (Tables 2 and 3).

**Table 2: Aid, Remittances and FDI Inflows to Fiji: 1980- 2012**

(in constant USD)

Period/year	Capital stock per capita	Aid per capita	REM per capita	FDI per capita
1980-89 (ave)	7,936	38.67	146.12	58.37
1990-99 (ave)	8,468	47.23	108.55	96.60
2000-04(ave)	9,364	171.32	82.83	107.37
2005-09(ave)	10,325	208.34	89.79	314.49
2010	10,861	195.01	101.78	411.11
2011	11,059	157.47	89.79	421.20
2012	12,100	175.89	70.75	258.40

(Source: World Bank, 2014)

**Table 3: Per capita GDP Growth Rate, and Aid, Remittances and FDI (% of GDP)**

Period / year	Growth Rate	Aid	REM	FDI
1980-89 (ave)	-0.4	5.4	1.4	2.1
1990-99 (ave)	2.1	3.6	1.5	3.2
2000-04(ave)	1.7	2.4	4.9	3.0
2005-09(ave)	-0.5	2.5	5.7	8.6
2010	1.9	2.8	5.4	11.4
2011	1.8	2.4	4.3	11.4
2012	1.1	1.9	4.7	6.9

(Source: World Bank, 2014)

### Modeling, Data and Methodology

This study assesses and compares the contributions of foreign aid, remittances and FDI to economic growth of Fiji during a 33-year period (1980-2012) and evaluate which one of the three kinds of capital transfers has emerged to be most effective. As a first step, the empirical investigation seeks to test the hypothesis that aid, remittances and FDI are positively associated with economic activities and growth in GDP.

Model

Our choice of the model stems from the Cobb-Douglas production function, along the lines employed by Luintel *et al.* (2008) and Rao *et al.* (2008) with constant returns and Hicks – neutral technical progress.

$$y_t = A_t k_t^{\beta_1} \quad 0 < \beta_1 < 1 \quad (1)$$

where:  $y$  = per capita output;  $A$ = stock of technology;  $k$  = capital stock per capita;

The Solow model assumes that the evolution of technology is given by

$$A_t = A_0 e^{gT} \quad (2)$$

where  $A_0$  is the initial stock of knowledge and  $T$  is time.

It is also plausible to assume that:

$$A_t = f(aid_t, rem_t, fdi_t) \quad (3)$$

Where,

$aid$  = aid inflows in constant US dollars per capita

$rem$  = inward remittances in constant US dollars per capita

$fdi$  = foreign direct investment in constant US dollars per capita

We enter  $aid$ ,  $rem$  and  $fdi$  as shift variables into the production function, noting labour and capital as fundamental and conditioning variables explaining growth. The Cobb-Douglas production is modified as

$$y_t = (A_0 e^{gT} aid_t^{\beta_2} rem_t^{\beta_3} fdi_t^{\beta_4}) k_t^{\beta_1} \quad (4)$$

The model for estimation purposes is written as follows:

$$Ly_t = \beta_0 + \beta_1 Lk_t + \beta_2 Laid_t + \beta_3 Lrem_t + \beta_4 Lfdi_t + \sum \lambda_m dum_{mt} + e_t \quad (5)$$

where:  $Ly_t$  is natural logarithmic real gross domestic product per capita (in US dollars in 2005 prices);  $Lk_t$  is natural logarithmic real capital stock per capita (in US dollars in 2005 prices);  $Laid$  indicates natural logarithmic official development assistance per capita(in US dollars in 2005 prices);  $Lrem$  is natural logarithmic remittances per capita (in US dollars in 2005 prices);  $Lfdi$  is natural logarithmic foreign direct investment inflows per capita (in US dollars in 2005 prices);  $dum_{mt}$  is a matrix of dummy variables to capture effects of shocks, coups and devaluations of 1988, 1999 and 2009; and  $e_t$  is the random error term.

Data

We utilize the data series of capital stock of Fiji in constant prices released from Penn Tables (University of Groningen, 2015). Since we do not have data on labour formally employed, we use population as a proxy, the assumption being that formal labour and population move in the same proportion. All the other data series are sourced from *World Development Indicators* (World Bank, 2014).

Results and Interpretations

Unit root tests are applied to level and first difference of each series. There are two different types of unit root tests used, namely Phillips and Perron (1988) unit root procedure and Ng and Perron (2001) modified-Phillips-Perron’s (PP) Z tests. The statistics of the tests are reported in Table 4, which show that all series are non-stationary at level, except FDI series as indicated by PP test. However, these variables are found stationary after first differencing, that is, they are integrated of order one.

Table 4: Results of Unit Root Tests

Vari	PP Test		Ng and Perron Test, MZa	
	Level (Constant with Trend)	First Difference (Constant without Trend)	Level (Constant with Trend)	First Difference (Constant without Trend)
$Ly$	-3.252	-7.316**	-7.992	-14.595**
$Lk$	-2.061	-4.872**	-0.293	-12.694**
$Lrem$	-2.449	-5.144**	-12.103	-12.162**
$Laid$	-2.829	-11.141**	-11.302	-19.813**
$Lfdi$	-4.638**	-10.347**	-15.374	-27.162**

Note: The PP critical value at 5% level is -2.96 and -3.56 for constant without trend and constant with trend regressions, respectively. These critical values are based on Mckinnon. The optimal lag is selected on the basis of Akaike Information Criterion (AIC). The Ng and Perron critical value is based on Ng and Perron (2001) critical value and the optimal lag is selected based on Spectral GLS-detrended AR based on SIC. The null hypothesis of the test is: a series has a unit root. The asterisk \*\* denotes the rejection of the null hypothesis at the 5% level of significance. The figures in brackets denote number of lags.

Analysis of the Effectiveness of Aid, Remittances and FDI: ARDL

The study examines the existence of a long run relationship between output, capita, foreign aid, remittances and FDI by applying bounds test

or autoregression distributed lag (ARDL) model proposed by Pesaran et al. (2001). Bound test with ARDL framework has a few advantages: (i) it allows testing for the existence of a cointegrating relationship between variables in levels irrespective of whether the underlying regressors are I(0) or I(1) (Pesaran and Shin, 1999; Pesaran et al., 2001); (ii) it is considered more appropriate than the Johansen-Juselius multivariate approach for testing the long run relationship amongst variables when the data are of a small sample size (Mah, 2000; Tang and Nair, 2002)<sup>3</sup>; (iii) Pesaran and Shin (1999) show that estimators of the short-run parameters are consistent and the estimators of long-run parameters are super-consistent in small sample sizes. Therefore, ARDL model has become increasingly popular in recent years. We begin the empirical analysis with this procedure.

The ARDL equations are given as follows:

$$\begin{aligned} \Delta Ly_t = & \beta_{10} + \beta_{11}Ly_{t-1} + \beta_{12}Lk_{t-1} + \beta_{13}Laid_{t-1} + \beta_{14}Lrem_{t-1} + \beta_{15}Lfdi_{t-1} + \beta_{16}D1 + \beta_{17}D2 \\ & + \sum_{i=1}^p \alpha_{11i} \Delta Ly_{t-i} + \sum_{i=0}^p \alpha_{12i} \Delta Lk_{t-i} + \sum_{i=0}^p \alpha_{13i} \Delta Laid_{t-i} + \sum_{i=0}^p \alpha_{14i} \Delta Lrem_{t-i} + \sum_{i=0}^p \alpha_{15i} \Delta Lfdi_{t-i} + \varepsilon_{1t} \end{aligned} \tag{7}$$

$$\begin{aligned} \Delta Lk_t = & \beta_{20} + \beta_{21}Ly_{t-1} + \beta_{22}Lk_{t-1} + \beta_{23}Laid_{t-1} + \beta_{24}Lrem_{t-1} + \beta_{25}Lfdi_{t-1} + \beta_{26}D1 + \beta_{27}D2 \\ & + \sum_{i=0}^p \alpha_{21i} \Delta Ly_{t-i} + \sum_{i=1}^p \alpha_{22i} \Delta Lk_{t-i} + \sum_{i=0}^p \alpha_{23i} \Delta Laid_{t-i} + \sum_{i=0}^p \alpha_{24i} \Delta Lrem_{t-i} + \sum_{i=0}^p \alpha_{25i} \Delta Lfdi_{t-i} + \varepsilon_{2t} \end{aligned} \tag{8}$$

$$\begin{aligned} \Delta Laid_t = & \beta_{30} + \beta_{31}Ly_{t-1} + \beta_{32}Lk_{t-1} + \beta_{33}Laid_{t-1} + \beta_{34}Lrem_{t-1} + \beta_{35}Lfdi_{t-1} + \beta_{36}D1 + \beta_{37}D2 \\ & + \sum_{i=0}^p \alpha_{31i} \Delta Ly_{t-i} + \sum_{i=0}^p \alpha_{32i} \Delta Lk_{t-i} + \sum_{i=1}^p \alpha_{33i} \Delta Laid_{t-i} + \sum_{i=0}^p \alpha_{34i} \Delta Lrem_{t-i} + \sum_{i=0}^p \alpha_{35i} \Delta Lfdi_{t-i} + \varepsilon_{3t} \end{aligned} \tag{9}$$

$$\begin{aligned} \Delta Lrem_t = & \beta_{40} + \beta_{41}Ly_{t-1} + \beta_{42}Lk_{t-1} + \beta_{43}Laid_{t-1} + \beta_{44}Lrem_{t-1} + \beta_{45}Lfdi_{t-1} + \beta_{46}D1 + \beta_{47}D2 \\ & + \sum_{i=0}^p \alpha_{41i} \Delta Ly_{t-i} + \sum_{i=0}^p \alpha_{42i} \Delta Lk_{t-i} + \sum_{i=0}^p \alpha_{43i} \Delta Laid_{t-i} + \sum_{i=1}^p \alpha_{44i} \Delta Lrem_{t-i} + \sum_{i=0}^p \alpha_{45i} \Delta Lfdi_{t-i} + \varepsilon_{4t} \end{aligned} \tag{10}$$

$$\begin{aligned} \Delta Lfdi_t = & \beta_{50} + \beta_{51}Ly_{t-1} + \beta_{52}Lk_{t-1} + \beta_{53}Laid_{t-1} + \beta_{54}Lrem_{t-1} + \beta_{55}Lfdi_{t-1} + \beta_{56}D1 + \beta_{57}D2 \\ & + \sum_{i=0}^p \alpha_{51i} \Delta Ly_{t-i} + \sum_{i=0}^p \alpha_{52i} \Delta Lk_{t-i} + \sum_{i=0}^p \alpha_{53i} \Delta Laid_{t-i} + \sum_{i=0}^p \alpha_{54i} \Delta Lrem_{t-i} + \sum_{i=1}^p \alpha_{55i} \Delta Lfdi_{t-i} + \varepsilon_{5t} \end{aligned} \tag{11}$$

There are two steps in examining the relationship between *Ly*, *Lk*, *Laid*, *Lrem* and *Lfdi*. First, we estimate Equations 7 to 11 by ordinary

least squares techniques. Second, the existence of a long-run relationship can be traced by imposing a restriction on all estimated coefficients of lagged level variables equating to zero. Hence, bounds test is based on the F-statistics (or Wald statistics) with the null hypothesis of no cointegration ( $H_0 : \beta_{i1} = \beta_{i2} = \beta_{i3} = \beta_{i4} = \beta_{i5} = 0$ ) against its alternative hypothesis of a long-run cointegration relationship ( $H_1 : \beta_{i1} \neq \beta_{i2} \neq \beta_{i3} \neq \beta_{i4} \neq \beta_{i5} \neq 0$ ).

Because annual data are used, the maximum number of lags for UECM is set to 4 and the optimal lag length is selected based on the Schwarz Bayesian criterion (SBC). The findings of the bounds test are reported in Table 5.

Table 5: Results of Bound Tests

Dependent Variable	Computed F-statistic				
<i>Ly</i>	14.902***				
<i>Lk</i>	1.063				
<i>Lrem</i>	0.604				
<i>Laid</i>	1.216				
<i>Lfdi</i>	2.353				
	Pesaran, et al. (2001) <sup>a</sup>			Narayan (2005) <sup>b</sup>	
	Critical Value	Lower bound value	Upper bound value	Lower bound value	Upper bound value
1 per cent		3.74	5.06	4.768	6.670
5 per cent		2.86	4.01	3.354	4.774
10 per cent		2.45	3.52	2.752	3.994

Notes: <sup>a</sup> Critical values are obtained from Pesaran et al. (2001), Table CI (iii) Case III: Unrestricted intercept and no trend, p. 300.

<sup>b</sup> Critical values are obtained from Narayan (2005), Table case III: unrestricted intercept and no trend, p. 10. \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% levels, respectively.

Results confirm the existence of a long run relationship amongst the variables when real output (*Ly*) is set as the dependent variable. The computed F-statistic is 14.902, which is greater than the upper critical values provided by Pesaran, et al (2001) and Narayan (2005) at 1% significance level. Hence, the null hypothesis of no cointegration is rejected for this equation. However, the respective computed F-statistics in the equations with other variables as dependent variables are found not statistically sig-

nificant even at 10% significance level. In order to make sure the estimated residual from Equation (7) is stationary, we use both Ng and Perron (2001) and modified Phillips-Perron's (PP) Z tests. The statistics of Ng and Perron and PP tests are -4.873 and -8.411, respectively which reject the null hypothesis at the 1% significance level. Thus, there is only one cointegration vector in the model.

Having confirmed the existence of a long-run relationship between real output, capita, foreign aid, remittances and FDI, we now proceed to estimate the long run equation by using the autoregressive distributed lag model (ARDL). As it was found that the trend variable was not significantly different from zero, it was dropped from the estimation procedure. The long-run equation is:

$$\begin{aligned}
 Ly_t = & 4.138 + 0.356Lk^{**} + 0.108Laid + 0.131Lrem^{***} + 0.076Lfdi^{***} \\
 t = & (2.644) \quad (2.571)(12.033) \quad (17.668) \quad (13.276) \\
 & -0.044D1^{***} + 0.068D2^{***} + 0.005TREND \\
 & (-6.116) \quad (8.653) \quad (1.790)
 \end{aligned}
 \tag{12}$$

[Note: \*\* and \*\*\* indicate significance at 5% and 1% levels respectively. Figures in parentheses representing calculated "t" values. ]

The estimated coefficients of logs of GDP per capita, foreign aid, remittances and FDI are positively associated with dependent variable,  $Ly_t$ . They are also found statistically significant at either 5% or 1% significance level. The coefficient of log of per capita capital stock is positive and is also statistically significant at 5% level. The magnitude of the coefficient of log of per capita capital stock, which denotes the profits share, is 0.356 which is consistent with the stylized value of one third. For the dummy variables, it is obvious that the coup could retard economic performance as it leads to instability in macroeconomic conditions. On the other hand, the devaluation strategy has proved beneficial as it caused a positive and significant effect on output. The trend variable although emerged with a positive sign, was found to be not significant.

A number of diagnostic tests such as Jacque-Bera normality test, serial correlation LM test, heteroskedasticity ARCH test, and Ramsey RESET mis-specification test were applied to Equation (4). This equation performs reasonably well as the disturbance terms are normally distributed and serially uncorrelated with homoskedasticity of residuals, con-

firmed the model has a correct functional form. Besides, the CUSUM and CUSUM of Squares plot show that the parameters of the model are stable over time<sup>4</sup>. Hence, it is reasonable to conclude that the model is well defined and well behaved.

#### Further Analysis: GMM

We proceed to estimate the long run equation by adopting Generalized Method of Moments (GMM) estimation procedure for dealing with biases arising from any potential endogeneity problem in explanatory variables. The equation is estimated by using instrumental variables estimators. Arellano and Bond (1991) proposed to use GMM in lagged level of endogenous variables as instruments. By doing this, the disturbance term is not serially correlated and the levels of the explanatory variables are weakly exogenous. In other words, they are not correlated with future error term. Nevertheless, a main limitation of the estimator is that it does not necessarily eliminate first-order serial correlation in the error terms. In view of this, the study uses the two-step system GMM estimator to control for the weak instrument problem. The first equation incorporates instruments in first differences, while the second equation incorporates instruments in levels. By including the second equation, the variables in first differences are instruments for the variables in levels which increase efficiency. The use of the two-step system GMM makes the standard covariance matrix robust to panel-specific autocorrelation and heteroskedasticity (You and Solomon, 2015: 255).

The Sargan test for over-identifying restrictions is used to evaluate the validity of the instruments. The null hypothesis of the test is that the instruments as a group are exogenous. The Arellano and Bond (AB) serial correlation tests in the difference error term are also used to examine the presence of serial correlation.

The estimated equation is:

$$\begin{aligned}
 Ly = & 4.33^{***} + 0.36Lk^{***} + 0.04Laid^{**} + 0.09Lrem^{***} + 0.02Lfdi^{**} - 0.03D1 + 0.03D2 \\
 t = & (7.77) \quad (5.43) \quad (2.70) \quad (8.80) \quad (2.16)(-0.99) \quad (1.57)
 \end{aligned}$$

Adj. R-squared=0.76; S.E. of regression=0.05; Sargan test (p-value) = 0.78; AR(1) (p-value) = 0.02; AR(2) (p-value) = 0.69.

<sup>4</sup> These results are not reported in order to conserve space. However, the results are available upon request.

From the GMM estimation, we find that capital stock, aid inflow, remittance and FDI have significant and positive impacts on the growth in Fiji. Specifically, 1% increase in capital stock will lead to 0.36% increase in growth. A 1% increase in aid inflows will lead to a 0.04% increase in the growth. If remittance increases by 1%, growth in Fiji will increase by 0.09%. Also, there will be 0.02% increase in growth if FDI increases by 1%. The two dummies (coups and devaluations) are found to be insignificant as a determinant of growth in the long run in Fiji. The Sargan test reveals that the instruments variables used in the GMM estimation are valid. For the serial correlation tests, it suggests that there are first order serial correlations (p-value is significant at 5% level), which is expected. However, there is no evidence of second-order serial correlation in the differenced error terms (p-value is 0.69).

*Marginal Effect of Aid, Remittances and FDI on Output: A Comparison*

With a view to comparing the marginal effect of these three capital inflows on per capita output we utilize the coefficients, which are also estimated elasticity coefficients. The summary of the coefficients and the marginal effects are shown in Table 6. The marginal effect of each capital flow is derived by using the following formula:

$$e = \frac{\left(\frac{\Delta y}{y}\right)}{\frac{\Delta x_i}{x_i}}$$

a. where *e* is elasticity of *y* (real output per capita), while *x<sub>i</sub>* are the three types of capital inflows (*i* = aid, re-Dealing with problems

**Table 6: Comparisons of Elasticity Coefficients and Marginal Effects - ARDL and GMM**

	ARDL		GMM	
	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Remittances	0.131	4.157	0.09	2.85
Aid	0.108	3.062	0.04	1.13
FDI	0.076	1.666	0.02	0.44

(Source: Authors' calculations)

This measurement of the marginal effect of the three types of capital inflows on *y*, using the average values of *y* and of remittances, aid and FDI is as follows:

*ARDL model:*

Marginal impact of remittances on *y*:  $= 0.131 \times \frac{US\$3155.32}{US\$99.56} = 4.157$

Marginal impact of aid on *y*:  $= 0.108 \times \frac{US\$3155.32}{US\$111.28} = 3.062$

Marginal impact of FDI on *y*:  $= 0.076 \times \frac{US\$3155.32}{US\$143.93} = 1.666$

*GMM model:*

Marginal Impact of remittances on *y*:  $= 0.09 \times \frac{US\$3155.32}{US\$99.56} = 2.85$

Marginal impact of aid on *y*:  $= 0.04 \times \frac{US\$3155.32}{US\$111.28} = 1.13$

Marginal impact of FDI on *y*:  $= 0.02 \times \frac{US\$3155.32}{US\$143.93} = 0.44$

With a view to comparing the marginal effect of these three capital inflows on per capita output we utilize the coefficients, which are also estimated elasticities. Using ARDL model, we find that the effect of remittance on real output is 4.157, which is higher than those of foreign aid (3.062) and FDI (1.666). The picture that emerges from the GMM model is quite similar. The impact of remittances on real output is 2.85, which is higher than that of foreign aid (1.13) and that of FDI (0.44). These magnitudes indicate that remittances have had a relatively higher effect on growth of the economy. The presence of these capital flows does seem to exert discernible positive effect on the economic growth of Fiji.

There are a few possible explanations for the different marginal effects in different types of private capital flows. Firstly, from the perspectives of a host country, FDI influences economic development in various ways<sup>5</sup>. First, it is a mechanism for the transfer of technology from multinational corporations (MNCs) or overseas producers (Helpman and Krugman, 1989; Georgiou and Weinhold, 1992). Second, FDI is also viewed as a catalyst for the transformation of the economic structure of a recipient country. Third, it may lead to the higher productive capacity of the economy by increasing the formation of human capital and/or various economic development activities based on natural resources.

Secondly, from economic policy point of view, foreign aid is generally used by policy makers to improve local conditions such as infrastructure, legal framework, education projects, and poverty and inequality. The effectiveness of this type of foreign capital, however, is conditional on the efficiency of local institutional quality of a recipient country such as corruption level, bureaucracy quality, law and order, and democratic accountability. Hence, there is no consensus that foreign aid generally does promote economic growth.

Finally, remittance flows act like a capital inflow as well as an income transfer from overseas to a home country. It is crucial to improve recipients' standard of living (consumption) and encourage households' investment in education and healthcare. The remittance is also business-like as the migrant makes investment in his home country and asks the family member to look after the investment project on his behalf. Hence, the effect of remittances on the economic development is faster and with high level of investment acceleration effect. On the other hand, both foreign aid and FDI are important vehicles for institution building and transfer of skills and technology and for upgrading managerial skills.

The speed at which these capital transfers operate may be different from each other. It is also likely that the effect of each of these three transfers on growth would be different from each other.

### *Granger Causality Test*

<sup>5</sup> Lloyd defines foreign capital or investment, particularly FDI as 'the internationalisation of the production activities of multinational corporations. Foreign direct investments are, therefore, part of the decisions of these corporations relating to the location of production and the sales of the outputs of the goods produced and the sources of the inputs used in their production.' (1996: 412-413).

Having established the existence of a long run relationship between the variables, we proceed to conduct Granger causality tests. Results are shown in Table 7. The results show the error-correction term (ECT) with the correct sign, statistically significant at 1% level in the equation with per capita output as dependent variable. This confirms that the linkage runs only from per capita capital stock, per capita aid, per capita remittances and per capita FDI to per capita output, since in contrast, ECT is not significant in other equations.

Further, the Granger causality test results confirm that in the long run, there is a unidirectional linkage running from foreign aid to per capita output, per capita capital stock, per capita remittances and per capita FDI; from per capita FDI to per capita remittances and from per capita remittances to per capita capital stock. Further, it is found that, except per capita foreign aid which Granger causes per capita output in only one direction, there is bidirectional causality between per capita output and per capita capital stock, per capita output and per capita remittances, per capita output and per capita FDI.

**Table 7: Granger Causality Tests**

Dependent Variable	F-statistics					ECT (t-statistics)
	$\Delta Ly$	$\Delta Lk$	$\Delta Lrem$	$\Delta Laid$	$\Delta Lfdi$	
$\Delta Ly$	-	2.278*	2.918*	5.461***	4.561**	-0.0728*** (-2.645)
$\Delta Lk$	2.887*	-	4.586**	2.888*	1.101	-0.0014 (-0.154)
$\Delta Lrem$	4.495**	1.823	-	2.869*	2.227*	-0.1960 (-0.885)
$\Delta Laid$	0.683	0.754	1.162	-	1.211	-0.4849 (-1.518)
$\Delta Lfdi$	2.300*	4.561**	1.816	2.353*	-	-0.4202 (-0.315)

Note: \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% levels, respectively. Figures in parentheses are t-statistics.

To sum up, empirical results confirm the hypothesis that foreign aid, remittances and FDI contribute significantly to per capita output.

## Conclusions and Policy Implications

The paper has examined the linkage between foreign aid, remittances, FDI and economic growth in Fiji by ARDL and GMM approaches for the period 1980-2012. Specially, the study also investigated the effectiveness of these capital flows on the Fijian economy. In so doing, it sought to offset a significant gap in existing studies on the associations between these international capital flows and economic growth. Both ARDL and GMM results suggest that these three capital flows have a significant and positive effect on the economic growth in Fiji. The findings are consistently in favour of significant gains to a recipient country from attracting more foreign aid, remittances and FDI.

Out of the three capital flows remittances have had the highest marginal impact on economic growth, followed by foreign aid and FDI. The conclusions are not surprising considering the fact that while foreign assistance is well known for its boomerang effects in that grants in aid are always tied to imports of goods and services from the benefactor country; and FDI in either manufacturing or service sectors including hotels/resorts are heavily dependent on imports of machinery and building materials and transport equipment as well as for consumption goods ranging from toilet paper to food and beverages. The leakages are thus heavy. They affect the size of the multiplier effects on GDP.

On the other hand, remittances received by families mostly living in rural areas are likely to be spent more on domestic consumption goods and local expenditures such as education and health services, minimizing leakages. The multiplier effects of expenditures out of remittances by recipient families are expected to be much higher. Further, although there are no results of longitudinal surveys done on the use of remittances at a micro-level, anecdotal evidence has it that increasing number of families are now saving part of their additional incomes for investment in housing and other construction activities as well as for starting small scale enterprises, as evidenced by a spurt in the number of informal business enterprises by rural households.

Policy implications are clear. Aside from increasing domestic demand, remittances do relax credit constraints of recipient families. The government will do well to facilitate financial sector development for mobilizing savings by sector institutions in rural areas where a large number of recipient families live. Further, it is suggested that special incentive schemes can be launched for encouraging small and medium enterprises which are linked with efforts of families utilizing the steady inflow of funds from relatives. These incentive schemes can be not only in

regard to credit but also in areas of marketing and for training potential entrepreneurs.

Future research possibilities exist in a few directions. One would be to focus on other variables as well, if and when consistent time series data gets available. These variables relate to law and order, efficiency in delivery of services and property rights which generally cover the governance dimensions. Another is a cross country panel analysis of major Pacific island countries which are heavily dependent on aid, remittances and FDI for example Fiji, Samoa, Solomon Islands, Tonga and Vanuatu. Such a panel analysis would provide a greater number of degrees of freedom as well. The other possible avenues through which foreign aid, remittances and FDI affect economic growth in the region, such as institutional quality and governance structures can also be explored. Another point of interest for future researchers is that remittances are also coming in from former citizens aspiring to become residents as retirees or residents by assuming citizenship again, through buying real estate or farms and starting factories of their own. Research may very well focus on this aspect once more data on use of remittances are available.

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